

REMARKS

Claims 1-7, 10-14 and 23-24, as amended, are currently pending and appear in this application for the Examiner's review and reconsideration. Claim 1 was amended to recite that the product is a spray dried product, while claims 2 and 4 have been amended to depend from claim 1. Claims 8-9, 15-22 and 25 are cancelled, with claims 8-9 being previously cancelled and Claims 15-22 and 25 cancelled herein to expedite the prosecution of this application and to reduce issues for appeal. As no new matter has been introduced, Applicants respectfully request that the amendments be entered at this time to reduce the issues for appeal.

The Examiner withdrew claims 15-22 as being directed to a non-elected invention. In order to expedite the prosecution of this application, these claims have been cancelled. Claim 25 has also been cancelled in response to the double patenting objection.

Claims 1-6, 13, and 23-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,812,445 (Eden *et al.*) for the reasons stated on pages 3-4 of the Office Action. Applicants respectfully traverse.

The present invention relates to *microcapsules*, i.e., capsules that are generally known to have a size of about 5-500 μm , and which comprise a perfuming or flavoring agent dispersed or adsorbed within a polymeric carrier. Microcapsules are known to rise and disperse in the air easily because of their small size and the presence of a polymeric carrier such as starch or other carbohydrates, especially when they contain a high content of volatile fragrances or flavors. These microcapsules are *spray-dried* and also are hazardous when dispersed, since they are highly flammable and likely to cause an explosion. The risk of an explosion is highest during the process of preparing microcapsules because microcapsules are often dispersed in the air for drying, such as during the spray-drying step. Despite the likelihood of severe damages to equipment and machinery and to staff handling the microcapsules, the problems of safety hazards of microcapsules have not been addressed thus far.

The present invention seeks to provide spray-dried microcapsules that are safer to prepare and handle by incorporating a fireproofing agent that is susceptible of reducing the microcapsules' inflammability and dust hazard explosive class. Such advantageous effect is achieved by incorporating fireproofing agents or explosion suppressants which efficiently reduce the strength of explosion and therefore reduce the risk of industrial injury to those handling

powders and materials containing microcapsules. Examples of fireproofing agents that can be used according to the invention include salts, such as those listed in claim 2.

In contrast, Eden does not relate to reducing the explosive hazards of microcapsules, but merely discloses regular encapsulation. Eden, in fact, is simply irrelevant to the present perfuming or flavoring microcapsules with a fireproofing agent because the reference does not even relate to *microcapsules*. In this regard, Applicants note that the encapsulated particles disclosed in Eden, which a skilled artisan would recognize as not being microcapsules, do not entail a risk of explosion when raised or dispersed in the air. This is why that situation is not even discussed in Eden. In addition, Eden relates to preparation of encapsulated material as a firm sheet, which is spread on a chilled surface during processing and then "cut, chopped or sliced in the wet state, then dried and ground to yield particles" (col. 1, lines 32-39). For instance, the sheet of encapsulated material is cut into "one quarter inch cubes," "pieces 10-20 mm long, 3 mm wide and approx. 0.5 mm thick," or "1/4 inch flakes" (col. 5, lines 54-55; col. 6, lines 42-43; col. 8, line 40), which are not as small as microcapsules and clearly do not present a risk of explosion. Hence, the encapsulated material of Eden is not spray dried as presently claimed and does not present the same problem as the microcapsules of the present invention in that they do not rise in air or present a risk of explosion.

Thus, the Examiner is incorrect in stating that "[t]he selection of optimal species of salt within the reference's generic disclosure is within the skill of ordinary practitioner" (Office Action at p. 4). Because Eden relates neither to microcapsules nor to their explosiveness, a person skilled in the art trying to reduce explosiveness of microcapsules would not have considered Eden to prepare less inflammatory microcapsules. Further, while Eden discloses using a salt during encapsulation, the salt is used not for any reduced explosiveness but merely to help prepare the encapsulated sheet on a chilled surface (*see* col. 2, lines 55-60 ("the addition of salt to the starch flurry results in more efficient formation of the sheet on the chilled surface")). Since Eden does not even relate to microcapsules and does not provide any suggestion or indication of how explosiveness of microcapsules can be reduced, there would have been no motivation to modify the firm, non-explosive encapsulated sheet of Eden to prepare perfuming or flavoring microcapsules with reduced explosiveness.

According to the inventors, the skilled person differentiates capsules according to their size: nanocapsules have a size which is generally below the wavelength of light and thus not

much greater than about 500 nanometer, microcapsules, have a size of up to about 500 μm , and, finally, macrocapsules have larger sizes which makes them individually visible to the human eye.

While the skilled person uses these size-relates indications in an approximative way, it remains clear that the microcapsules are different from the $\frac{1}{4}$ inch cubes of Eden. In other words, and contrary to what is mentioned in the advisory action, the present claims directed to microcapsules do recite a limitation of size. In addition, with the presently filed amendments claim 1 is now directed to spray-dried microcapsules.

The amendment to claim 1 underscores that the advantages of the present invention are very important for spray-dried powders. These powders have particularly high risk of explosion, because very small particles containing flammable fragrances or flavors are suspended during the manufacturing process in a spray-drying tower. In particular, the droplets of emulsified fragrances or flavors in a polymeric carrier are suspended and exposed to hot air for drying. Under these circumstances, the addition of a fireproofing agent brings the advantages related to the protection of human lives and equipment as mentioned earlier.

In contrast, Eden teaches away from spray-dried powders. Eden specifically teaches, in col. 2, lines 27-40:

Some methods have been proposed for spray-drying the dimethyl anthranilate with dextrin or other modified starches. Such spray-dried, encapsulated dimethyl anthranilate has two major drawbacks; first, it is water soluble, making it unsuitable for [...]. In contrast, when dimethyl anthranilate is encapsulated using the methods described herein, it can be encapsulated in a water-insoluble starch matrix which will provide a controlled rate of release of the bird repellent. (emphasis added)

By mentioning drawbacks of spray-drying, Eden clearly dissuades from using spray-drying technology, while the present invention is exactly directed to spray dried microcapsules. Furthermore, Eden's products are large sized cubes of starch film, so Eden is not concerned with fireproofing or explosion suppression at all. Under these circumstances Eden cannot render claim 1 obvious. Accordingly, Applicants respectfully submit that Eden does not render present claims obvious and request the rejections based on Eden be withdrawn.

Claims 7 and 14 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Eden alone or in view of U.S. Patent No. 6,475,542 (Soeda *et al.*) for the reasons set forth on pages 4-5

of the Action. As explained above, however, Eden does not relate to explosive microcapsules. Further, Eden, in combination with Soeda, does not render the present claims obvious.

Soeda relates to a coacervation process for preparing microcapsules. A coacervation process is a process in which hydrophobic oil is emulsified in water and a protein (e.g., gelatin) wall is formed around the emulsified oil-droplets. Because a coacervation process always takes place in an aqueous environment (*see col. 5, lines 47-56; col. 6, lines 28-38*), there is no risk of explosion during the manufacturing process. The microcapsules formed according to Soeda are also completely different from the present spray dried microcapsules in that they do not comprise a polymeric or any such carrier to which a fireproofing agent can be added. In fact, no carrier is needed for the capsules disclosed in Soeda because hydrophobic oil as emulsified droplets is directly encapsulated without a carrier.

Further, while Soeda mentions using an edible salt, salt is used not as part of the capsule but to assist in wall formation during the salting-out process by being added to the aqueous solution containing protein. Thus, the salt is not used as a fireproofing agent in forming the microcapsules in Soeda, and would not help suppress explosiveness of the microcapsules when the capsules are removed from the aqueous solution. As in Eden, there is no imminent risk of explosion during the microcapsule forming process according to Soeda, and the reference provides no suggestion or motivation to include a fireproofing agent, especially given the lack of a polymeric carrier to which a fireproofing agent can be added. Hence, a person skilled in the art would have no motivation to alter Soeda to provide a microcapsule with a fireproofing agent, because there is no need in Soeda for reducing explosiveness of the microcapsules and because the microcapsules lack carrier material to which a fireproofing agent can be added.

Accordingly, neither Eden nor Soeda, alone or in combination, teaches, discloses or suggests the present method for preparing perfuming or flavoring microcapsules with a fireproofing agent or products made with the present method, and the rejections based on Eden and Soeda should be withdrawn. It appears that this has been achieved since the rejections based on Soeda were not repeated in the advisory action.

Claims 11-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Eden in view of U.S. Patent No. 6,555,098 (Murphy *et al.*) for the reasons stated on pages 5-6 of the Office Action.

As previously explained, however, Eden is irrelevant to the present invention since it does not disclose microcapsules that include a fireproofing agent. Combining that reference with Murphy also does not render any of the present claims obvious.

Murphy relates to an alkali metal bicarbonate or ammonium bicarbonate deodorant powder with a fine grain particle size that is free-flowing and essentially free of agglomerated solids (col. 1, lines 43-46). Alkali metal bicarbonate is included to provide improved deodorant properties in the cosmetic deodorant products according to Murphy. Employing bicarbonate only for its deodorant properties, Murphy simply does not relate to reducing the explosive hazards of microcapsules and does not disclose or suggest including a fireproofing agent, especially considering that the present independent claim 1 specifically excludes the use of sodium bicarbonate as fireproofing agent. Thus, the disclosure in Murphy of the deodorant properties of bicarbonate does not render obvious the inclusion of a fireproofing agent in present microcapsules, and is simply irrelevant to the present microcapsules with reduced explosiveness. Since neither Eden nor Murphy discloses incorporating a fireproofing agent in microcapsules, or even relates to reducing explosive hazards of microcapsules, these references, either alone or in combination, does not render any of the present claims obvious. Similarly, it would not be obvious to a skilled artisan to modify the deodorant products of Murphy in view of Eden, which does not even relate to microcapsules, to reach perfumed products comprising perfuming microcapsules with a fireproofing agent as recited in present claims 11 and 12.

Accordingly, Applicants respectfully request that the rejections based on Eden and Murphy be withdrawn. For at least these reasons, therefore, all the claim rejections under § 103 should be withdrawn.

As noted above, the present claim amendments should be entered at least to reduce the issues for appeal but applicants respectfully submit that the amendments fully distinguish the invention from the cited references.

In view of the preceding explanation, the entire application is believed to be in condition for allowance, early notice of which would be appreciated. Should any issues remain, a personal or telephonic interview is respectfully requested to discuss the same in order to expedite the allowance of all the claims in this application.

An extension of time is submitted to make this filing timely as of July 8, 2005. Any questions regarding this matter can be directed to the undersigned.

Respectfully submitted,

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